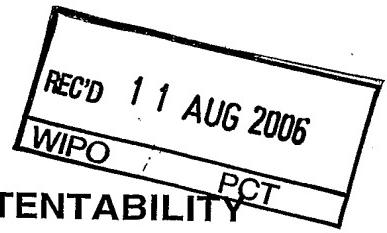


## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)



## (PCT Article 36 and Rule 70)

Applicant's or agent's file reference R610-PCT	<b>FOR FURTHER ACTION</b>	
	See Form PCT/IPEA/416	
International application No. PCT/JP2005/008466	International filing date (day/month/year) 27.04.2005	Priority date (day/month/year) 27.04.2004
International Patent Classification (IPC) or national classification and IPC INV. B01J23/10 B01J23/63 B01D53/94 B01J37/03		

Applicant TOYOTA JIDOSHA KABUSHIKI KAISHA
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<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <ul style="list-style-type: none"> <li>a. <input checked="" type="checkbox"/> <i>(sent to the applicant and to the International Bureau)</i> a total of 2 sheets, as follows:           <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> </li> <li>b. <input type="checkbox"/> <i>(sent to the International Bureau only)</i> a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</li> </ul>
<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the report</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input checked="" type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>

Date of submission of the demand 27.02.2006	Date of completion of this report 10.08.2006
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer  Schoofs, B  Telephone No. +31 70 340-2760



# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/JP2005/008466

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on

- the international application in the language in which it was filed
- a translation of the international application into , which is the language of a translation furnished for the purposes of:
  - international search (under Rules 12.3(a) and 23.1(b))
  - publication of the international application (under Rule 12.4(a))
  - international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

### Description, Pages

1-16 as originally filed

### Claims, Numbers

1-7 filed with telefax on 24.02.2006

### Drawings, Sheets

1/3-3/3 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3.  The amendments have resulted in the cancellation of:

- the description, pages
- the claims, Nos.
- the drawings, sheets/figs
- the sequence listing (*specify*):
- any table(s) related to sequence listing (*specify*):

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- the description, pages
- the claims, Nos.
- the drawings, sheets/figs
- the sequence listing (*specify*):
- any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

# **INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

International application No.  
PCT/JP2005/008466

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## **Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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### **1. Statement**

Novelty (N)	Yes:	Claims
	No:	Claims 1-7
Inventive step (IS)	Yes:	Claims
	No:	Claims 1-7
Industrial applicability (IA)	Yes:	Claims 1-7
	No:	Claims

### **2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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## **Box No. VI Certain documents cited**

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1. Certain published documents (Rule 70.10)  
and / or
2. Non-written disclosures (Rule 70.9)

**see separate sheet**

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## **Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/JP2005/008466

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following document:

D1: PATENT ABSTRACTS OF JAPAN vol. 2003, no. 12, 5 December 2003 (2003-12-05) & JP 2003 277060 A (TOYOTA MOTOR CORP), 2 October 2003 (2003-10-02)

2. The present application relates to an exhaust gas purifying catalyst comprising rhodium supported on a metal oxide particle with a ceria core and a zirconia surface layer (claim 1), and a process for producing such a catalyst (claim 8).
- 2.1 D1 discloses a cerium-zirconium metal oxide particle with a ceria core and a zirconia surface layer (D1, abstract). Based on the English abstract only, it would appear that the presently claimed subject-matter differs from D1 in that rhodium is supported on the Ce-Zr-metal oxide particle. However, although the examiner does not understand Japanese, it appears that D1 already discloses that Rh can be supported on the metal oxide particles (D1, [0002]). The particles of D1 are inevitably made up of primary particles and there is no reason to doubt that the difference between the isoelectric point of the ceria and zirconia is at least 3. Hence, the novelty of independent claims 1 and 7 cannot be acknowledged (Article 33(2) PCT).
- 2.2 Dependent claims 2-6 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (Article 33(2) PCT), or are associated with any technical effect that could support the presence of an inventive step (Article 33(3) PCT).

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/JP2005/008466

**Re Item VI**

**Certain documents cited**

**Certain published documents**

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date ( <i>valid claim</i> ) (day/month/year)
EP-A-1 516 855	23.03.2005	16.09.2003	

**Re Item VIII**

**Certain observations on the international application**

1. The term "relatively rich" used in claim 7 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear (Article 6 PCT).

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CLAIMS

1 (Amended). An exhaust gas purifying catalyst comprising a metal oxide particle and rhodium supported thereon,

wherein said metal oxide particle comprises a core part and a surface layer, the molar fraction of the cerium constituting the ceria in the core part being higher than the molar fraction of the cerium constituting the ceria in the surface layer, and the molar fraction of the zirconium constituting the zirconia in the surface layer being higher than the molar fraction of the zirconium constituting the zirconia in the core part; and

wherein said core part and said surface layer each comprises a plurality of primary particles.

2 (Renumbered). The exhaust gas purifying catalyst according to claim 1, wherein the molar fraction of cerium is from 35 to 50 mol% based on the total molar number of cerium and zirconium in said metal oxide particle.

3 (Renumbered). The exhaust gas purifying catalyst according to claim 1 or 2, wherein the total molar fraction of cerium and zirconium is at least 85 mol% based on the total molar number of metals in said metal oxide particle.

4 (Renumbered). The exhaust gas purifying catalyst according to any one of claims 1 to 3, wherein said metal oxide particle has an average particle diameter of less than 10  $\mu\text{m}$ .

5 (Renumbered). The exhaust gas purifying catalyst according to any one of claims 1 to 4, wherein at least one element selected from the group consisting of alkaline earth metals and rare earths is added to said core part relatively rich in ceria.

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6 (Renumbered). The exhaust gas purifying catalyst according to any one of claims 1 to 5, wherein at least one element selected from the group consisting of alkaline earth metals and rare earths is added to said surface layer relatively rich in zirconia.

7 (Amended). A process for producing an exhaust gas purifying catalyst, comprising:

providing a sol containing at least a population of ceria colloid particles and a population of zirconia colloid particles differing in the isoelectric point with each other, the difference between the isoelectric points being at least 3,

adjusting the pH of said sol to be closer to the isoelectric point of said population of ceria colloid particles than to the isoelectric point of said population of zirconia colloid particles, thereby aggregating said population of ceria colloid particles,

adjusting the pH of said sol to be closer to the isoelectric point of said population of zirconia colloid particles than to the isoelectric point of said population of ceria colloid particles, thereby aggregating said population of zirconia colloid particles onto said aggregated population of ceria colloid particles,

drying and firing the obtained aggregate to obtain a metal oxide particle comprising a core part relatively rich in ceria and a surface layer relatively rich in zirconia, and

loading rhodium on the obtained metal oxide particle.